How to Improve Efficiency and Decrease Operating Expenses

Are you looking for opportunities to improve the efficiency of your production operations and decrease operating expenses? This pollution prevention opportunity assessment can help you identify opportunities that will not only lead to increased profits, but also reduce environmental impacts. Please complete the steps on pages 248–254 to help identify ways to:

- Reduce operating expenses;
- Use fewer raw materials;
- Reduce energy consumption;
- Reduce wastes and emissions;
- Meet and reduce regulatory requirements;
- Improve employee safety; and
- Project a positive company image in your community.

Next, complete Worksheets 1–3 on pages 255–260 in order to prioritize the identified opportunities and associated processes. If you have questions or would like confidential assistance completing the assessment and/or worksheets, contact IDEM's Office of Pollution Prevention and Technical Assistance at (800) 988-7901 or (317) 232-8172.

Process Control

List the production processes that would be enhanced by process controls, such as:

- Tracking scrap/reject rates;
- Implementing a statistical process control system;
- Tracking waste generation rates;
- Quantifying the costs associated with the wastes generated;
- Planning production schedules to reduce the generation of hazardous and nonhazardous waste; and
- Preparing and posting written operation procedures.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Alternative Materials/Production Equipment

List the production processes that could use alternative materials or production equipment, such as:

- Materials with low to no volatile organic compound (VOC) content;
- Materials that contain no hazardous air pollutants (HAPs);
- Alternative production processes that would reduce air emissions;
- Alternative production processes that generate less solid wastes;
- Production equipment that reduces air emissions; and
- Production equipment that generates less solid wastes.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Material Storage and Handling

List the production processes that would be improved by material storage and handling procedures, such as:

- Storing raw materials in a manner that protects them from damage;
- Tracking material usage in your production processes;
- Organizing production processes to minimize material handling; and
- Monitoring raw material inventories to ensure that products do not exceed their expiration date.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Purchasing and Inventory Management

List the production processes that would be improved by purchasing and inventory management systems, such as:

- Establishing a centralized purchasing program;
- Utilizing a *just-in-time* purchasing program;
- Implementing a *first in–first out* policy for materials purchased;
- When feasible and practical, purchasing materials in bulk or larger containers;
- Maintaining an inventory of unused materials that could potentially be used in other departments or divisions of the company; and
- Requesting suppliers to take back used shipping containers, totes, and pallets for reuse.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Shipping and Receiving

List the production processes that would be improved by implementing shipping and receiving practices, such as:

- Inspecting materials before accepting a shipment;
- Dating material containers when received; and
- Improving the packaging of the final product to better protect it from damage during transport.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Employee Training

List the production processes that would be improved by implementing employee training programs, such as:

- Training employees in the proper handling of chemicals;
- Training employees in proper work practices to optimize production, reduce scrap rate, and minimize material usage; and
- Periodically reviewing employee work practices to optimize production, reduce scrap rate, and minimize material usage.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Leak Prevention/Spill Control

List the production processes that could implement a system to prevent chemical leaks and control chemical spills, such as:

- A written schedule for inspecting production equipment and storage containers for leaks;
- A written chemical spill prevention plan and written procedures for containing a spill; and
- A written procedure for managing raw and waste materials in a manner that minimizes the possibility of a release into the environment and worker exposure.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Equipment Calibration

List the production processes that could be enhanced by scheduled equipment calibration, such as:

- Scheduled calibration of pollution control devices and monitoring equipment in accordance with the manufacturer's recommendations and permit requirements; and
- Scheduled calibration of quality control monitoring and measurement equipment.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Housekeeping and Maintenance Practices

List the production processes that would be improved by housekeeping and maintenance practices, such as:

- A written schedule for the cleaning of production equipment;
- A written maintenance schedule for production equipment; and
- A written procedure for cleaning of production areas and equipment.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Recycling

List the production processes that could implement a recycling program, including:

- Reusing all possible wastes and scrap;
- Segregating all recyclable wastes from non-recyclable wastes; and
- Recycling all recyclable materials.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Energy Efficiency

List the production processes that could improve energy conservation, through methods such as:

- Conducting energy audits addressing heating/cooling systems, lighting, steam systems, and electric motors;
- Scheduling inspections of compressed air systems;
- Developing a written service schedule for all heating/cooling systems and industrial process heaters; and
- Tracking utility costs and considering alternative energy sources.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Environmental Management System

List the production processes that could implement elements of an environmental management system, such as:

- Preparing a written environmental/pollution prevention policy;
- Establishing written pollution prevention goals; and
- Creating a pollution prevention team.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Management Practices and Commitment

List the production processes that could be improved by management practices and commitment, such as:

- Management stressing the importance of pollution prevention to all employees;
- Management establishing facility-wide pollution prevention goals;
- Management requiring the facility to conduct periodic pollution prevention opportunity assessments; and
- Management promoting employee suggestions concerning potential pollution prevention practices and measures.

Process 1: _____

Process 2: _____

Process 3: _____

Process 4: _____

Process 5: _____

Process 6: _____

Instructions for Worksheet 1

1. Photocopy Worksheet 1 on page 256 so you have enough space to accommodate the production processes you identified in Appendix E.
2. Write each production process identified in Appendix E in the spaces provided.
3. Place an X in the corresponding column for each opportunity identified for that process.
4. Total the number of Xs for each process.
5. Proceed to Worksheet 2 on pages 257–258.

Worksheet **1**

Production Processes and Identified Opportunities

Production Process	Process Control	Alternative Materials/ Production Equipment	Material Storage and Handling	Purchasing and Inventory Management	Shipping and Receiving	Employee Training	Leak Prevention/Spill Control	Equipment Calibration	Housekeeping and Maintenance Practices	Recycling	Energy Efficiency	Environmental Management System	Management Practices and Corporate Commitment	**Total Number of Opportunities Identified**

Instructions for Worksheet 2

1. Make enough photocopies of Worksheet 2 on page 258 so you have space to complete the following exercise.
2. Identify the five production processes with the highest scores from Worksheet 1. List them along with the opportunity associated with each process in the spaces provided. A process may have more than one opportunity, so a production process may be listed multiple times.
3. To help you prioritize the processes and associated opportunities identified, assign a score to the column heading for each opportunity using a scale of 1 to 5 (a score of 5 indicates the most beneficial, such as those with the highest potential for waste/emissions reductions, cost savings, regulatory burden relief, and reducing employee exposure).
4. Total the scores for each process and associated opportunity.
5. Proceed to Worksheet 3 on pages 259-260.

Worksheet **2**

Clean Manufacturing and Pollution Prevention Opportunity Assessment Ranking

	Potential Reduction in Waste/Emissions	Potential Cost Savings	Potential Reduction in Regulatory Burdens	Potential Reduction in Employee Exposure	**Total Score**
Opportunity					
Production Process					

Instructions for Worksheet 3

1. Identify the top three scoring production process and associated opportunities from Worksheet 2. List them in the order of the total score assigned, with the process and associated opportunity having the highest score listed under Priority 1.
2. Assign a goal (i.e., what you intend to achieve and the proposed completion date). Specify the employee within your facility responsible for overseeing the achievement of that goal.

Priority 1	
Production Process	
Opportunities	
Facility Goal	
Proposed Completion Date	
Responsible Employee	

Continued on next page ▶

Worksheet **3**

Priority Production Process Opportunities

Priority 2	
Production Process	
Opportunities	
Facility Goal	
Proposed Completion Date	
Responsible Employee	

Priority 3	
Production Process	
Opportunities	
Facility Goal	
Proposed Completion Date	
Responsible Employee	